

# The Gross Flow of Finished Commodities and New Construction, 1929-41

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FOR almost a decade the Bureau of Foreign and Domestic Commerce has prepared authoritative estimates of the national income in terms of the returns to the factors of production (wages, dividends, interest, etc.) and the contributions by industries (manufacturing, agriculture, trade, etc.). In 1941 the Bureau was authorized by Congress to make estimates of the national income in terms of final products or actual goods and services produced.<sup>1</sup>

It is hardly necessary to point out the economic significance of such estimates. By means of the final products breakdown, the configuration of cyclical shifts in the production of goods and services is brought into clearer perspective; the economic implications of passing from a peace to a war economy are revealed; and materials essential for the analysis of the post-war problem are provided. Even for the war years alone, the final products details are highly useful. Not only do they make possible a better appraisal of civilian requirements, but they are indicative of the progress of the war effort.

The estimates of gross commodity flow presented in this article form the largest segment of the final products study. They are being released separately and in advance of the complete study at the request of several of the war agencies which require the data for the wide variety of decisions in economic matters that must be made from day to day. It is hoped that economic analysts, both in government and private business, will find them useful, even though the estimates may fall short of the final degrees of refinement that would have been insisted upon in less urgent times.

Before describing the estimates, it is desirable to show their place in the complete study. In its entirety, the final products study envisages a breakdown of the national income in terms of 8 major components, all measured at final costs to the ultimate users; i. e., after the addition of all pertinent transportation and distributive costs:

1. Flow of Consumers' Services through Private Enterprises.
2. Flow of Consumers' Commodities through Private Enterprises.
  - a. Perishable.
  - b. Semidurable.
  - c. Durable.

3. Gross Flow of Producers' Durable Goods through Private Enterprises.

- a. Equipment.
- b. Plant.

4. Capital Consumption.

5. Net Flow of Producers' Durable Goods through Private Enterprises (3)-(4).

6. Net Change in Inventories.

7. Net Change in Foreign Claims.

8. Final Product of Government.

The present estimates represent preliminary variants of components (2) and (3). Consumption commodities are essentially comparable to component (2) but, until Government purchases of such commodities are segregated, cannot be treated as the exact equivalent. Producers' durable goods are substantially comparable in scope to component (3). However, they too include Government purchases, and in addition that part of component (8) represented by public construction done on Government force account.<sup>2</sup>

Refinement of the present estimates in order to match the appropriate components together with work on the remaining components is well under way. Summary articles on the more important of the remaining components, on capital consumption, and on variations in distributive costs (a byproduct of the study) will be published as soon as the progress of the work permits.

Further elaboration of the final products data is also planned. Two aspects are worthy of mention: (a) adjustments for price changes in order to approximate the variations in the physical volume of goods; (b) a study of the purchases of capital equipment and also plant by specific industries. It is anticipated also that the preparation of quarterly and monthly estimates will prove feasible, so that the current information required by business can be made available.

As already indicated, the estimates in this article relate to the flow of consumption commodities and the gross value of new equipment and construction. Capital consumption has not yet been subtracted. Hence the relative importance of the estimates can best be understood by comparing them with the gross national product rather than with the national income.

A preliminary measure of the gross national product was described in the March issue of the *Survey*.<sup>3</sup> This

<sup>1</sup> The pioneer investigation in this field was made by Simon Kuznets at the National Bureau of Economic Research. A detailed report, *Commodity Flow and Capital Formation*, was published by the National Bureau in 1938.

<sup>2</sup> In 1941 some Government production of ships and armaments is also included.

<sup>3</sup> Gilbert, Milton, "War Expenditures and National Production," *Survey of Current Business*, March 1942, p. 9.

measure was defined to include the value of the output of private enterprise at market prices (i. e., the sales of all business units, adjusted for changes in inventories, and with interbusiness purchases deducted) and the value of the goods and services produced directly by Government in terms of their cost to Government.

Total gross national product thus defined was estimated at 86 billion dollars in 1939, 94 billion in 1940, and 115 billion in 1941.<sup>4</sup> The gross flow of commodities and new construction for these three years were 55, 61, and 81 billion dollars, or 64, 65, and 70 percent of gross national product, respectively. The remainder in each year consists of consumer expenditures on services, net changes in business inventories, net changes in foreign claims, and Government expenditures—ordinary and defense—other than those already included in the commodity flow totals. Since the gross flow of commodities and new construction constitutes about two-thirds of the gross national product, its economic significance is clear.

#### Classification of Commodities.

As a first step in the preparation of the estimates, all commodities were classified as finished or unfinished. Finished commodities were defined to include: (a) Consumption commodities that had reached the stage at which they could be taken over by the ultimate user without further processing,<sup>5</sup> and (b) such commodities as machinery, durable equipment and plant intended for multiple use in production and with an average life of 3 or more years.

Classification under (a), however, did not depend solely on the degree of processing; it was based also on the use to which a commodity is put. Flour, for example, was classified as finished if consumed in households, institutions, or Government agencies, but as unfinished if consumed by a factory making bread or other products for which flour is a raw material. Similarly, a barrel of apples destined for direct consumption was treated as finished but as unfinished if used by a commercial bakery.

Unfinished commodities were defined to include all commodities entering further into the productive process other than those lasting on an average of 3 years or more. Since their value is already covered in the value of finished commodities for which they constitute materials, commodities once so classified no longer constitute a part of the study. To include them would cause duplication in the final totals.

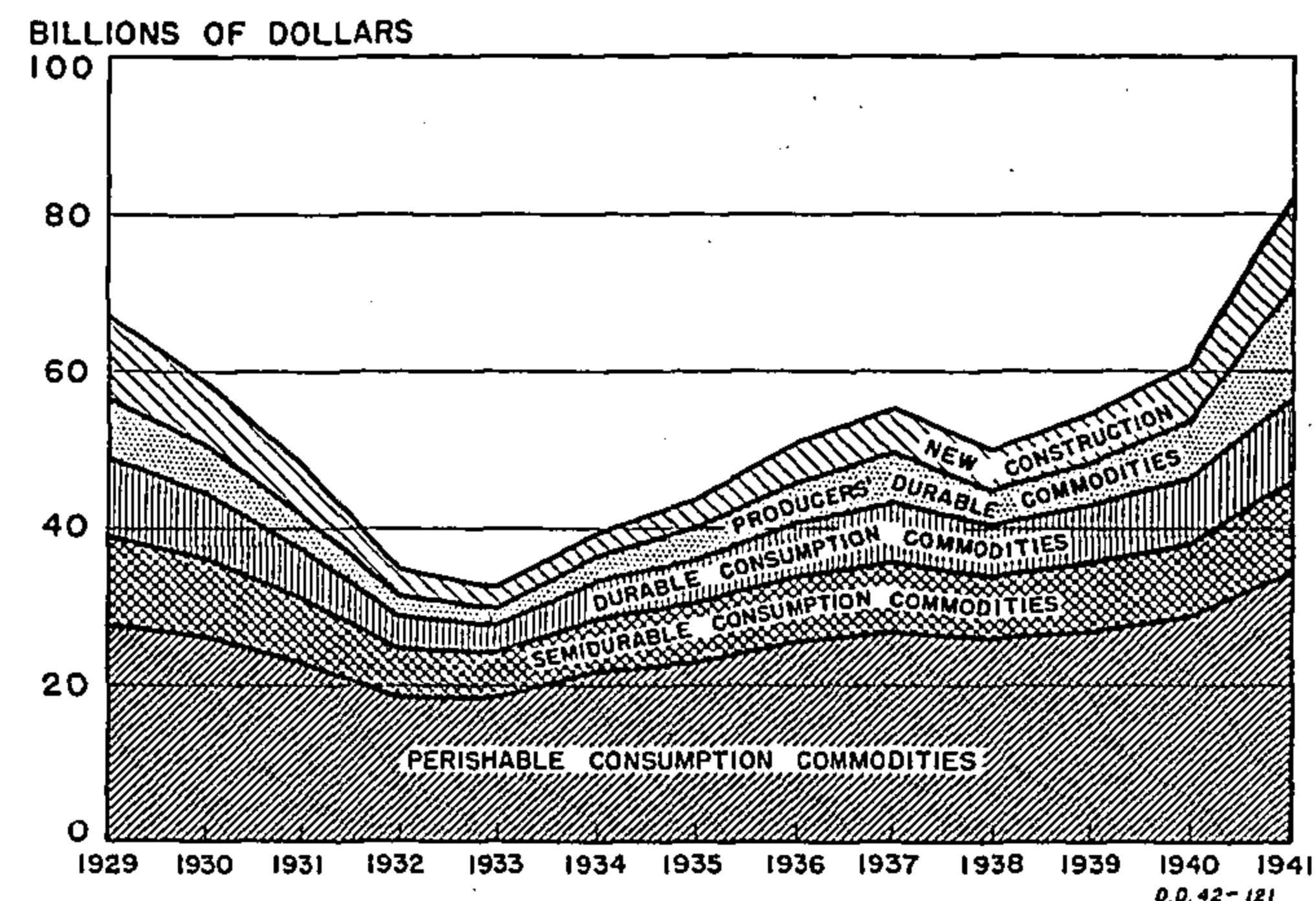
Finished consumption commodities were next classified by durability as perishable, semidurable, or durable. Perishable were defined as those with an *average* life of 6 months or less, semidurable, those with an

*average* life of between 6 months and 3 years, and durable, those *usually* lasting more than 3 years. Within each of these major groups a varying number of minor groups were established. Their designations (table 2) suggest the specific commodities included.

#### The Gross Flow of Commodities and New Construction.

Although analysis and interpretation of the estimates are beyond the scope of this article, it is desirable to draw attention to some of the more significant facts that are revealed.

Figure 6.—Gross Flow of Finished Commodities and New Construction



Source: U. S. Department of Commerce.

The gross flow of commodities and new construction reached 81 billion dollars in 1941—by far the highest level ever achieved. The 1941 peak figure exceeded the depression low of 1933 by 49 billion dollars, the heretofore high of 1929 by 14 billion, and the 1940 total by 20 billion. Some part of the rise can be explained by price changes. But even if adjustment is made for such changes, there can be no doubt that with respect to the flow of goods, 1941 was a record year.

The output of all types of goods expanded in 1941. The sharpest increase was in producers' durable commodities and construction from 14 billion dollars in 1940 to 25 billion in 1941, a direct reflection of the beginnings of rearmament. Approximately 7 billion of the 25 reflects the production of military and naval equipment, cantonments, etc. A large part of the remainder reflects the production of equipment and plant designed to make possible the war program adopted for 1942 and 1943.

The flow of all types of consumption commodities also rose substantially in 1941. The value of nondurables was 45 billion dollars in this year as compared with 38 in 1940; of durables, 10 as compared with 8. These upward surges would, of course, be reduced somewhat by correction for price changes and by exclusion of government military purchases in 1941. But even after such allowance it is evident that consumers received the largest volume and selection of goods our economic system has every made available.

<sup>4</sup> Revised estimates running back to 1929 as well as a more complete description of concept and methods of derivation will appear in a forthcoming issue of the *Survey of Current Business*.

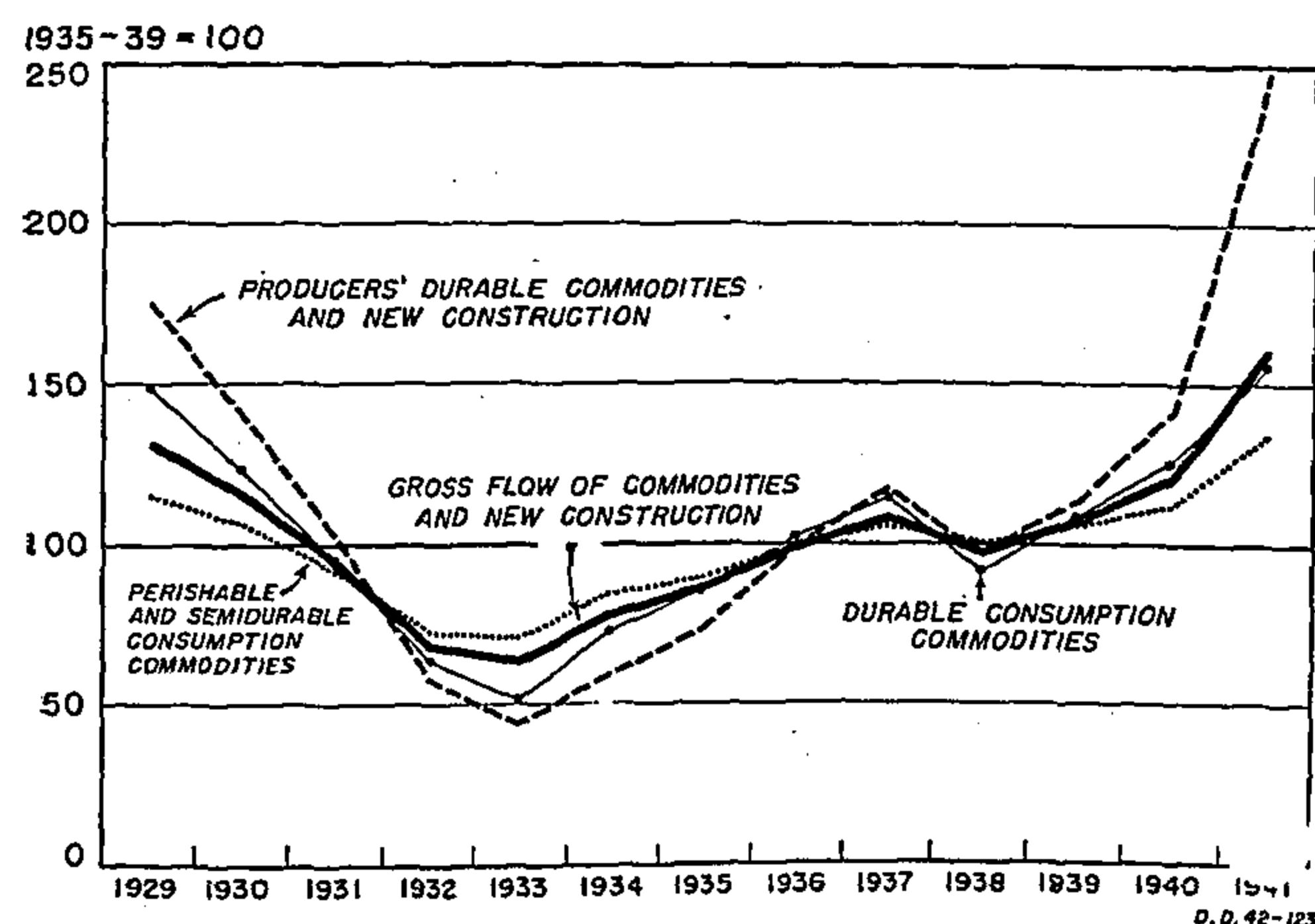
<sup>5</sup> As already indicated, consumption by ultimate users includes Government purchases of such commodities as well as those of household consumers. Work on the segregation of these purchases is in progress.

Table 1.—Gross Flow of Finished Commodities and New Construction by Major Groups, Final Cost to Users, 1929-41

Item	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
<b>ABSOLUTE VALUES</b>													
[Millions of dollars]													
Consumption commodities:													
Perishable.....	27,988.4	26,136.6	22,754.8	18,344.0	18,292.5	21,643.3	22,867.4	25,466.0	26,876.6	25,884.1	26,920.2	28,623.0	34,010.0
Semidurable.....	11,167.1	10,018.3	8,372.2	6,235.3	5,873.9	6,917.2	7,502.0	8,356.9	8,793.7	8,088.8	8,558.3	9,293.1	11,440.0
Durable.....	9,863.0	8,127.3	6,320.1	4,194.6	3,426.0	4,809.5	5,646.9	6,737.9	7,556.9	6,044.4	7,122.0	8,277.9	10,310.0
Total flow of consumption commodities..	49,018.5	44,282.2	37,447.1	28,773.9	27,592.4	33,370.0	36,016.3	40,560.8	43,227.2	40,017.3	42,900.5	46,194.0	55,760.0
Producers' goods:													
Producers' durable commodities.....	7,326.2	6,014.3	4,203.6	2,351.5	2,099.5	3,069.7	4,032.6	5,149.9	6,284.7	4,538.6	5,382.2	7,401.1	14,490.0
New construction.....	10,668.0	8,398.0	6,347.0	3,578.0	2,485.0	3,044.0	3,497.0	5,062.0	5,748.0	5,392.0	6,245.0	7,085.0	10,811.0
Total producers' goods.....	17,994.2	14,412.3	10,550.6	5,929.5	4,584.5	6,113.7	7,529.6	10,211.9	12,032.7	9,930.6	11,627.2	14,486.1	25,301.0
Gross flow of commodities and new construction.....	67,012.7	58,694.5	47,997.7	34,703.4	32,176.9	39,483.7	43,545.9	50,772.7	55,259.9	49,947.9	54,527.7	60,680.1	81,061.0
<b>INDEX NUMBERS</b>													
[1935-39=100]													
Consumption commodities:													
Perishable.....	109.3	102.1	88.9	71.6	71.4	84.5	89.3	99.5	105.0	101.1	105.1	111.8	132.8
Semidurable.....	134.2	120.4	100.6	74.9	70.6	83.1	90.2	100.4	105.7	97.2	106.5	111.7	137.5
Durable.....	149.0	122.7	95.4	63.3	51.7	72.6	85.3	101.8	114.1	91.3	107.6	125.0	155.7
Total flow of consumption commodities..	120.9	109.2	92.4	71.0	68.1	82.3	88.8	100.0	106.6	98.7	105.8	113.9	137.5
Producers' durable commodities.....	144.3	118.4	82.8	46.3	41.3	60.5	79.4	101.4	123.8	89.4	106.0	145.8	285.4
New construction.....	205.6	161.8	122.3	69.0	47.9	58.7	67.4	97.6	110.8	103.9	120.4	136.5	208.4
Total producers' goods.....	175.3	140.4	102.8	57.8	44.7	59.6	73.3	99.5	117.2	96.7	113.3	141.1	246.4
Gross flow of commodities and new construction.....	131.9	115.5	94.5	68.3	63.3	77.7	85.7	99.9	108.8	98.3	107.3	119.4	159.5

Over the period 1929-40 (1941 is omitted because of the inclusion of several billion dollars of military equipment and armaments) the dominating role of consumption commodities is evident. Of an average total of 49.6 billion dollars, consumption commodities are 39.1 billion or nearly four-fifths. The extent to which the peacetime economy is geared to the production of goods intended for direct consumption is clear.

Figure 7.—Indexes of Gross Flow of Finished Commodities and New Construction



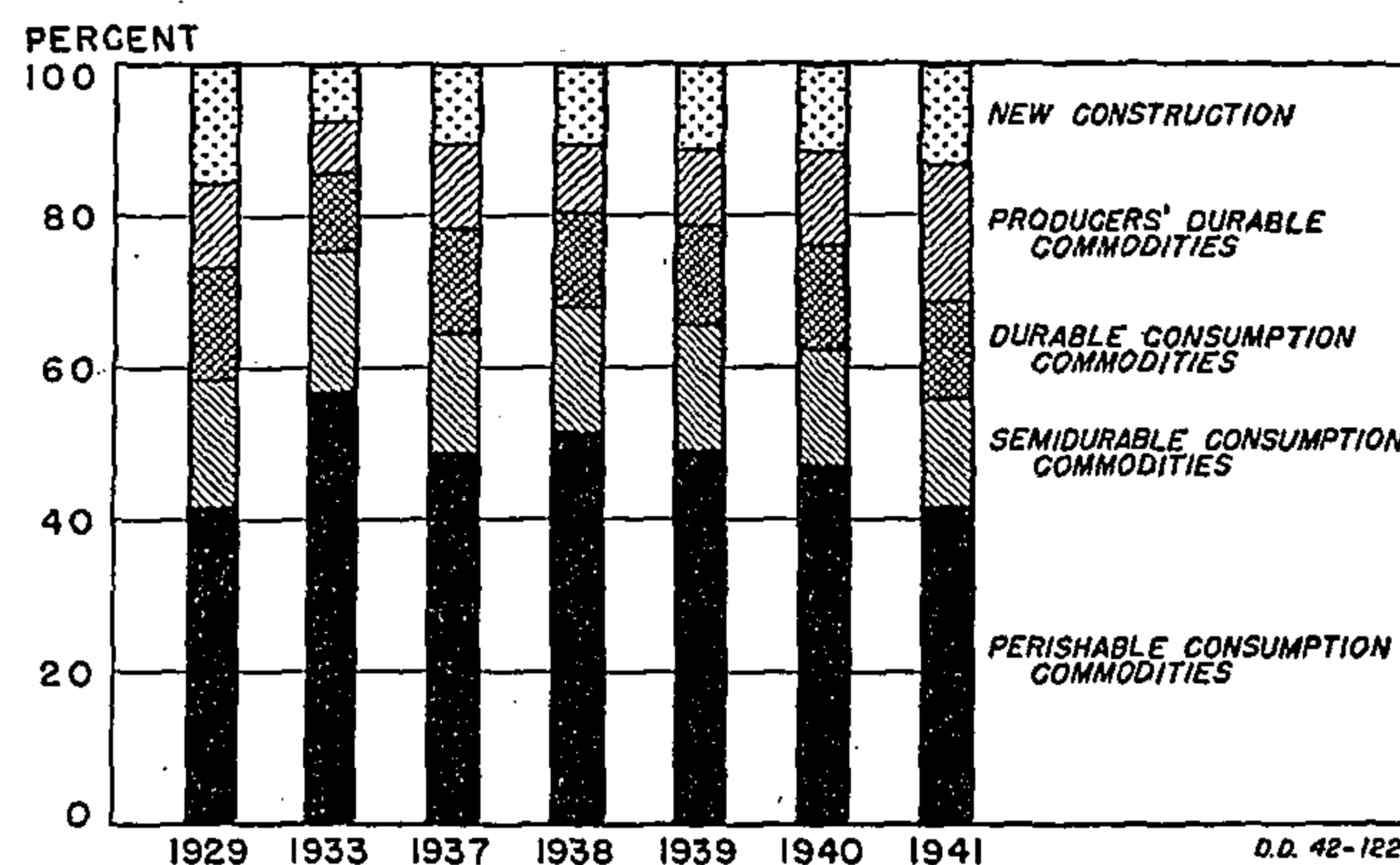
Source: U. S. Department of Commerce.

Within the major classification of consumption commodities, the perishable group (foods, drug preparations, paper products, fuels, etc.) is by far the most important, averaging about 24.3 billion dollars for 1929-40. The semidurable group (clothing, light housefurnishings, automobile accessories, etc.) is next with an 8.3 billion average; while the durable (furniture, heavy housefurnishings, pleasure vehicles, etc.) averages about 6.5

billion. The two broad groups of producers' goods, producers' durable commodities (machinery, equipment, etc.) and new construction (residential, business, public, etc.) average some 4.8 and 5.6 billions, respectively.

It might be inferred from the relative size of the commodity groups that an analyst might well concentrate upon consumption commodities. But with respect to the temporal movements the amounts (table 1 and figures 6 and 7) and the percentage shares (figure 8) of the various groups fluctuate almost in inverse proportion to their average size.

Figure 8.—Percentage Distribution of Gross Flow of Finished Commodities and New Construction



Source: U. S. Department of Commerce.

In years of lower business activity, such as 1933 and 1938, the dollar values of consumption commodities decline less relatively than do those for producers' goods; in years of higher activity, such as 1929, 1937, 1939, and 1940, they usually rise less. The differing degree of stability is indicated by the shifting percent-

Table 2—Gross Flow of Finished Commodities and New Construction by Minor Groups, Final Cost to Users, 1929-41

[Millions of dollars]

Item	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941*
<b>CONSUMPTION COMMODITIES</b>													
<i>Perishable</i>													
1. Manufactured foods and kindred products	13,186.7	12,284.4	10,529.4	8,247.1	8,417.3	10,732.8	11,694.7	13,015.3	13,906.5	13,496.9	13,936.9	14,809.1	17,470.0
2. Nonmanufactured foods:													
Sales	5,833.3	5,452.3	4,533.1	3,612.3	3,736.5	4,063.7	4,134.2	4,706.8	4,837.9	4,456.8	4,678.2	4,996.8	6,250.0
Farm consumption	1,585.0	1,428.0	1,157.0	915.0	926.0	1,002.0	1,233.0	1,302.0	1,346.0	1,184.0	1,121.0	1,124.9	1,470.0
3. Cigars, cigarettes, tobacco, and smoking supplies	2,114.4	1,934.1	1,993.9	1,643.1	1,474.6	1,584.1	1,571.1	1,780.3	1,860.5	1,828.9	1,879.2	1,993.3	2,270.0
4. Drug preparations and household medical supplies	676.6	684.4	624.2	545.0	502.7	602.9	569.1	630.7	674.2	670.2	760.7	803.5	960.0
5. Toilet preparations	495.0	492.3	465.5	394.1	326.0	389.8	365.6	384.4	405.6	409.9	483.7	508.1	570.0
6. Cleaning and polishing preparations	299.1	301.4	271.2	208.1	206.7	229.7	237.0	278.6	320.5	353.7	369.8	355.1	400.0
7. Magazines, newspapers, and other printed matter	552.2	530.9	516.4	453.5	441.4	474.9	482.1	492.3	541.3	521.5	588.5	616.7	640.0
8. Stationery and writing supplies	279.0	283.6	249.8	172.0	148.7	173.3	192.7	214.0	235.6	222.4	256.3	279.5	330.0
9. Miscellaneous household paper products	233.3	228.2	186.7	133.6	136.5	162.1	181.2	207.7	233.6	237.1	254.0	274.1	320.0
10. Toys, games, sport supplies	191.4	173.1	154.7	122.8	106.1	121.8	119.6	137.7	151.5	154.4	171.0	191.3	230.0
11. Manufactured household illuminating and heating products	254.0	253.9	261.3	311.9	257.2	366.8	402.8	523.5	500.9	522.3	555.5	669.4	770.0
12. Nonmanufactured household fuels:													
Sales	989.9	931.6	772.5	625.3	619.1	742.4	660.6	686.2	643.6	566.0	597.5	686.5	800.0
Farm consumption	113.7	108.9	95.7	93.3	96.8	97.7	103.7	103.4	105.6	99.0	109.5	105.1	130.0
13. Fuels for passenger cars	1,184.8	1,049.5	943.4	866.9	796.9	899.3	920.0	1,008.1	1,113.3	1,161.0	1,158.4	1,210.5	1,400.0
Total perishable consumption commodities	27,988.4	26,136.6	22,754.8	18,344.0	18,292.5	21,643.3	22,867.4	25,466.0	26,876.6	25,884.1	26,920.2	28,623.0	34,010.0
<i>Semidurable</i>													
14. Clothing and accessories	6,893.8	6,277.1	5,195.5	3,763.4	3,533.4	4,192.4	4,605.2	5,129.3	5,217.5	4,845.6	5,403.8	5,697.8	7,080.0
15. Shoes and other footwear	1,710.5	1,509.0	1,210.7	995.3	972.0	1,095.8	1,067.2	1,157.9	1,272.5	1,186.5	1,220.0	1,222.6	1,540.0
16. Personal furnishings	245.2	232.2	173.3	118.3	101.1	123.6	154.2	184.1	195.0	181.4	201.8	211.3	250.0
17. Dry goods and notions	885.6	771.0	624.1	436.7	450.8	486.3	523.5	563.5	606.6	513.1	525.6	551.9	630.0
18. Semidurable house furnishings	655.0	526.4	490.0	367.8	364.4	481.0	575.6	661.7	787.7	736.0	815.7	878.5	1,080.0
19. Replacement tires and tubes	511.1	418.6	370.7	294.9	217.1	239.3	239.0	233.4	245.2	261.1	299.5	268.5	310.0
20. Passenger car replacement parts and accessories	265.9	284.0	307.9	258.9	235.1	298.8	337.3	427.0	469.5	365.1	391.9	462.5	550.0
Total semidurable consumption commodities	11,167.1	10,018.3	8,372.2	6,235.3	5,873.9	6,917.2	7,502.0	8,356.9	8,793.7	8,088.8	8,858.3	9,293.1	11,440.0
<i>Durable</i>													
21. Household furniture	1,070.3	912.0	702.7	487.7	312.5	524.9	559.9	716.2	834.3	720.0	799.0	870.9	1,070.0
22. Floor coverings	554.8	389.4	334.4	231.9	139.6	292.0	263.3	321.8	381.8	318.0	359.3	384.7	470.0
23. Miscellaneous durable house furnishings	879.2	770.7	682.6	488.8	360.0	436.7	474.5	579.3	619.1	620.5	794.0	886.1	1,090.0
24. Heating and cooking apparatus	364.7	332.3	245.3	160.2	143.3	205.8	262.1	337.5	371.9	297.0	344.5	433.7	650.0
25. Refrigerators, washing machines, and sewing machines	376.5	340.3	293.8	194.6	234.5	292.3	325.8	394.2	491.7	344.3	381.3	460.4	640.0
26. Electrical household appliances	138.5	135.3	121.1	79.1	67.3	104.3	130.2	159.2	175.6	169.8	194.7	217.0	260.0
27. Other household appliances	22.6	22.2	18.4	12.7	10.3	13.3	14.1	15.7	18.8	20.7	22.5	25.7	30.0
28. China, glassware, tableware, and household utensils	591.2	487.2	505.2	430.4	306.8	445.3	428.5	520.2	513.0	463.2	542.5	564.5	800.0
29. Radio apparatus and phonographs	878.1	813.4	475.5	225.4	184.9	236.5	282.4	358.7	366.5	310.4	377.8	415.6	500.0
30. Pianos and organs	78.5	56.5	35.7	20.7	14.2	18.7	24.1	32.4	40.6	37.7	41.7	47.0	60.0
31. Other musical instruments	32.9	28.5	21.9	15.4	11.6	16.5	25.1	26.8	28.3	25.9	28.7	28.7	35.0
32. Clocks and watches	187.0	176.2	133.3	90.2	65.8	96.4	100.5	127.4	184.9	151.9	178.2	205.1	270.0
33. Jewelry and sterling silverware	518.8	471.3	335.7	250.7	162.6	212.0	232.5	214.2	245.5	263.2	292.0	336.0	440.0
34. Books and other durable printed matter	426.4	368.3	336.5	243.6	196.2	239.4	249.8	285.7	304.1	287.0	311.9	327.8	410.0
35. Writing equipment	104.5	90.5	72.5	50.6	39.8	39.6	48.5	54.6	57.0	52.9	52.9	52.6	70.0
36. Ophthalmic products, surgical and orthopedic appliances	148.5	164.9	123.5	97.0	108.1	133.1	134.3	140.7	159.8	149.2	175.8	181.1	220.0
37. Monuments and tombstones	127.1	120.4	98.0	70.9	52.5	60.7	62.6	67.3	72.1	63.7	61.0	61.9	65.0
38. Luggage	116.9	92.9	58.3	38.9	29.9	26.3	30.3	47.1	58.8	53.4	49.4	52.7	80.0
39. Wheel goods, durable toys, and sports equipment	276.4	254.3	225.1	172.8	142.9	172.1	189.2	217.5	259.9	271.7	298.5	337.6	390.0
40. Passenger cars	2,953.5	2,089.2	1,490.9	828.8	840.8	1,239.9	1,804.0	2,114.4	2,364.2	1,418.4	1,810.4	2,382.5	2,750.0
41. Pleasure-craft	16.6	11.5	9.7	4.2	2.4	3.7	5.2	7.0	9.0	5.5	5.9	6.3	10.0
Total durable consumption commodities	9,863.0	8,127.3	6,320.1	4,194.6	3,426.0	4,809.5	5,646.9	6,737.9	7,556.9	6,044.4	7,122.0	8,277.9	10,310.0
<b>PRODUCERS' GOODS</b>													
<i>Producers' durable commodities</i>													
42. Factory machinery	598.3	448.2	345.7	207.0	214.6	282.2	353.4	450.1	523.0	362.3	415.4	531.0	850.0
43. Mining machinery	110.0	75.6	32.0	21.7	24.9	41.7	60.9	98.7	114.8	69.3	81.0	92.6	160.0
44. Construction machinery	166.3	134.4	96.0	42.9	29.3	46.8	63.6	100.0	125.4	94.7	109.9	136.9	220.0
45. General and miscellaneous machinery and equipment	969.9	813.1	539.0	293.2	274.1	387.6	504.8	642.8	769.8	517.9	595.6	1,891.3	1,120.0
46. Engines and turbines	68.1	56.3	35.9	16.4	13.7	22.6	31.0	43.1	52.7	35.3	41.5	77.9	180.0
47. Pumps and pumping equipment	199.0	176.0	132.3	74.4	51.5	62.5	82.3	122.2	157.5	135.8	145.4	185.3	260.0
48. Machine tools and accessories	388.7	220.5	136.6	64.1	76.3	121.3	192.6	282.3	355.7	213.2	288.8	507.4	920.0
49. Electrical apparatus and equipment	613.7	514.9	396.0	185.5	131.5	198.7	269.6	344.5	481.6	353.1	433.6	575.9	1,000.0
50. Farm machinery and equipment	271.2	232.6	184.4	98.8	51.9	89.0	148.5	194.5	244.3	239.1	220.1	254.4	330.0
51. Tractors	210.2	199.1	122.2	60.3	44.4	84.2	148.0	219.7	272.2	215.0	222.7	279.5	390.0
52. Office machinery	166.6	123.7	89.3	62.6	60.7	93.5	108.6	129.5	162.9	151.8	149.8	163.3	250.0
53. Nonresidential furniture and equipment	409.8	338.5	267.7	148.8	108.8	154.6	173.9	204.0	263.1	220.3	247.6	328.7	540.0
54. Durable containers	191.7	176.0	123.3	94.4	100.3	123.7	127.5	140.2	176.8	134.2	142.4	158.3	220.0
55. Professional and scientific equipment	111.6	99.9	76.9	48.6	37.9	48.2	66.9	77.3	101.3	91.8	116.8	149.6	270.0
56. Tools	193.0	160.6	118.9	83.3	73.3	103.9	118.2	137.6	164.1	141.5	152.1	185.3	330.0
57. All other subsidiary durable equipment	386.2	327.3	246.0	177.7	174.3	206.6	234.0	267.0	287.9	249.8	294.1	355.9	580.0
58. Wagons and carts	9.7	7.2	5.2	3.3	3.7	7.0	6.9	7.4	7.0	3.8	1.5	2.6	5.0
59. Business motor vehicles	1,729.5	1,354.0	1,003.0	558.5	542.4	818.2	1,103.7	1,304.1	1,425.8	930.5	1,177.8	1,548.3	2,270.0
60. Motorcycles	7.4	7.2	6.1	3.5	2.4	3.5	4.5	5.6	7.4	6.1	8.0	10.4	15.0
61. Locomotives and railroad cars	360.7	364.9	95.6	44.6	21.6	99.9	116.0	188.2	363.8	143.4	166.6	306.7	410.0
62. Ships and boats	96.2	133.3	104.8	33.3	33.1	42.0	79.4	127.9	136.4	148.1	225.6	347.5	410.0
63. Aircraft	68.4	51.0	46.7	28.6	28.8	32.0	38.3	63.2	91.2	81.6	145.9	312.3	3,170.0
Total producers' durable commodities	7,326.2	6,014.3	4,203.6	2,351.5	2,099.5	3,069.7	4,032.6	5,149.9	6,284.7	4,538.6	5,382.2	7,401.1	14,490.0

See footnotes at end of table.

Table 2.—Gross Flow of Finished Commodities and New Construction by Minor Groups, Final Cost to Users, 1929-41—Con.

[Millions of dollars]

Item	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941*
<b>PRODUCERS' GOODS—continued</b>													
<i>New construction</i> <sup>2</sup>													
64. Private residential (non-farm).....	3,562.0	1,790.0	1,460.0	638.0	413.0	591.0	913.0	1,368.0	1,655.0	1,767.0	2,046.0	2,323.0	2,675.0
65. All other private.....	4,695.0	3,831.0	2,310.0	1,146.0	856.0	967.0	1,135.0	1,520.0	2,055.0	1,539.0	1,698.0	2,086.0	2,561.0
66. Public residential.....						1.0	9.0	61.0	93.0	35.0	81.0	202.0	482.0
67. All other public.....	2,411.0	2,777.0	2,577.0	1,794.0	1,216.0	1,485.0	1,440.0	2,113.0	1,945.0	2,051.0	2,420.0	2,474.0	5,093.0
Total volume of new construction.....	10,668.0	8,398.0	6,347.0	3,578.0	2,485.0	3,044.0	3,497.0	5,062.0	5,748.0	5,392.0	6,245.0	7,085.0	10,811.0
Gross flow of commodities and new construction.....	67,012.7	58,694.5	47,997.7	34,703.4	32,176.9	39,483.7	43,545.9	50,772.7	55,259.9	49,947.9	54,527.7	60,680.1	81,061.0

\*All 1941 figures are preliminary. It is believed that the 1941 perishable consumption commodity group total includes about 250 million dollars of government purchases for military use; and the semidurable and durable about 450. The producers' durable commodity group is thought to include about 5,100 million dollars of such purchases, and the volume of new construction about 1,800 million of direct military and naval construction.

<sup>1</sup> Includes durable armaments (ordnance, arms, tanks, etc.), some of which were produced in government plants.

<sup>2</sup> Combined in order to avoid disclosure. The 1941 estimates for ships include the output of government shipyards.

<sup>3</sup> For a more detailed break-down of construction activity, see Survey of Current Business, February 1942, table 15, page 36.

ages in figure 8. In 1933, for example, consumption commodities constituted 86 percent of the total flow; in a prosperous year like 1940, 76 percent.

Even within the major classification of consumption commodities there are significant variations in the response over the course of the business cycle. The perishable group fluctuates least; the semidurable somewhat more; and the durable most of all. Indeed, the indexes in table 1 and figure 7 show the amplitude of fluctuation in durable consumption commodities to be almost as great as those in the two categories of producers' goods.

Detailed information concerning the nation's commodity output is afforded by the minor commodity groups. Foods and kindred products, for example, dominate the perishable consumption group, averaging almost 75 percent of the total. Moreover, in value they far exceed the total of any other single major group. Within the perishable group it is also of interest to note the shift from nonmanufactured to manufactured household fuels.

The semidurable consumption group consists chiefly of clothing and accessories; the durable of heavy housefurnishings and appliances and passenger cars. In the latter group the rising importance of electrical household appliances is particularly notable.

To study these and other details is not the purpose of this paper; but it is well to stress that such study would make it possible to approximate and to analyze changes in the composition of what may be termed the commodity part of the national consumer budget.

The details of the flow of producers' goods throw considerable light on both the over-all pattern of gross capital formation and the changes therein. Grouping the estimates into the different categories of machinery and equipment and the various kinds of construction provides one useful type of functional arrangement. For example, the heavier and more durable types of equipment declined more rapidly from 1929-33 than did the lighter and less durable. Although the relationship of durability to replacement requirements partially explains this difference, knowledge concerning the flow

of equipment to particular industries is needed. Work on an industrial allocation is in progress.<sup>6</sup>

#### Sources and Methods.

This brief summary of sources and methods can do little more than suggest the basic data involved in the derivation of the estimates. When the final products study is completed, it is planned to describe the techniques of estimate in full. In the meantime, those who are interested in greater detail may consult the files of the Bureau of Foreign and Domestic Commerce.

For most commodities, the procedure of estimate involved securing data at producers' prices, classifying and allocating the different commodities among the appropriate groups, and then tracing the various groups through the distributive system. This somewhat roundabout method was adopted because of the availability of very detailed commodity data at the production level. At the wholesale and retail levels there is a relative scarcity of such detail.

The descriptions that follow apply chiefly to the estimates for 1929-39. For 1940 and especially 1941, cruder methods necessarily had to be employed. For most groups the 1929-39 estimates of final cost to user were extrapolated directly by using a wide variety of relevant series on output, pay rolls, and retail sales. In addition, specific allowances were made to insure the inclusion of armament output.

#### 1. Derivation of the data at producers' values.—

a. *Manufactured commodities.*—The basic source for manufactured commodities is the Biennial Census of Manufactures. Output data for several thousand commodities are there reported for the odd years 1929-39.

For the most part, the Census data are comparable from year to year. However, three minor deficiencies should be noted. First there is reason to believe that the coverage of 1933 Census was slightly less complete than that in other years. When some indication was given of the deficiency in an individual industry—

<sup>6</sup> The Bureau has already done considerable work in this field. See Chawner, Lowell J., "Capital Expenditures in Selected Manufacturing Industries," *Survey of Current Business*, December 1941, p. 19.

usually less than 2 percent—Census data were raised. The 1933 Census was also notable for its relative lack of detail in commodities reported. More than for any other Census year it was necessary to break down combinations of commodities on the basis of the details reported for proximate years.

The second and third minor deficiencies lay in the difficulty of setting up strictly comparable series over the decade for many commodities made in the textile industries and in the differing degrees of coverage of some of these industries in particular Census years. Aside from careful attempts to achieve proper classification, little could be done to overcome these deficiencies; and it is possible that for 1935 and 1937 especially, figures for some of the component commodities of such groups as clothing and dry goods may be slightly too low.

Although classification of the several thousand Census commodities was not always easy, the greater number could be assigned directly to one or another group. Those that could not be so assigned required special study.

Most of the difficulties of classification related to the fundamental distinction between finished and unfinished. Fortunately, two very useful types of commodity information were also available in Census reports: Materials consumed data in the *Biennial Census of Manufactures* and sales distribution data by class of purchaser in *Distribution of Sales of Manufacturing Plants*, for 1929, 1935, and 1939, and in the *Wholesale Census* reports for 1929, 1933, 1935, and 1939. By using this information along with numerous special commodity studies—both government and trade—it was possible to achieve fairly reliable breakdowns for most of the mixed commodities.

Since by their very nature these breakdowns were approximations, it is desirable to suggest the effect of possible errors in allocation on our estimates. In 1939, for example, commodities that had first to be broken down before they could be assigned to a specific group constituted 28 percent of the output of perishable consumption commodities, 59 percent of semidurable, 44 percent of durable, and were negligible in producers' durable. Thus, even a *net* error of allocation as large as 20 percent—an unlikely extreme—would affect the major consumption commodity group totals by 6, 12 and 9 percent, respectively, and the producers' durable commodity group not at all. For particular minor groups, the extreme percentage effect, computed in similar fashion, may be somewhat greater, but probably still not so serious as to reduce appreciably the reliability of any group total. Furthermore, there is no reason to suspect sizeable temporal variations in the percentages.

The preceding comments on manufactured commodities relate solely to Census years. For the intercensal years the estimates were of necessity based on less complete information. Nevertheless, even the intercensal

estimates are believed to be of a fairly high order of reliability.

From a wide variety of sources there were assembled as many different interpolating series for each minor commodity group as were available. These series were then checked and tested against one another by noting carefully the degree of coverage and by examining the changes from Census year to Census year in the ratios of the various sample series to the Census year totals. For each group that series was chosen which showed the most complete coverage and constancy of relationship. Reasonably good intercensal interpolations were obtained for every commodity group.

b. *Nonmanufactured commodities.*—Nonmanufactured commodities relevant to the study are found in the products of farms, fisheries, and mines. Of these products, those that are classifiable as finished fall into two of the perishable consumption commodity groups: nonmanufactured foods and fuels.

Annual statistics on agricultural products were secured from data compiled by the Department of Agriculture. Because a substantial amount of fruits, vegetables, milk and other farm products are used in the manufacturing process, cash income received by farmers had to be apportioned between finished and unfinished. This was accomplished by using special tabulations of the Department of Agriculture along with Census data on materials consumed in manufacturing.

In addition to cash income received by farmers for finished crop and livestock products, the estimates for nonmanufactured agricultural foods include commodities produced and utilized for human consumption on farms. Since such products do not pass through the market, they required no further adjustments for distributive mark-up as did most of the other finished commodities.

Nonmanufactured foods also include the products of commercial fisheries. Estimates of the value of edible fish other than that canned, dried, or otherwise preserved, which had already been covered under manufactured foods, were derived chiefly from compilations of the Bureau of Fisheries.

Finished nonmanufactured fuels include firewood and anthracite and bituminous coal. The estimates for firewood were derived from data of the Department of Agriculture; those for coal from data of the Bureau of Mines.

c. *Construction.*—The construction estimates are, with the exception of the private nonfarm residential, the most recent ones of the Bureau of Foreign and Domestic Commerce. Private nonfarm residential construction was computed by the Bureau of Labor Statistics. All the figures are on a work done or activity basis and include major additions and alterations as well as new construction. Since detailed construction estimates were published in the February

1942 issue of the *Survey* (p. 36) they have not been reproduced here.

2. *Tracing the flow of finished commodities.*—The commodity estimates to this point are valued at producers' prices, f. o. b. farm, factory and mine. To pass from output at producers' prices to the final cost to ultimate users, all commodities except those produced and consumed on farms had to be followed through the distributive system. Since it was not feasible to trace the flow of each individual commodity, the necessary adjustments and additions to producers' values were made using the 63 commodity groups as units. For most groups the sequence of adjustments and additions can be outlined in step form. In the brief descriptions that accompany the outline it should be kept in mind that the various inventory, foreign trade, sales, and mark-up data, whether for commodities, industries, or types of store, were always first combined so as best to correspond with the minor commodity groups.

a. *Translation of output at producers' prices to f. o. b. sales at producers' prices; i. e., adjustments for changes in inventories of finished commodities held by producers.*—The 1937, 1938, and 1939 adjustments were based chiefly on the detailed inventory data reported in the Census of Manufactures. Sales-production ratios were computed for these years and extended to earlier years by similar ratios computed for related corporate industry groups as reported in *Statistics of Income*. Since the original values obtained for nonmanufactured foods were in terms of sales, no inventory adjustment had to be applied to that group.

b. *Addition of transportation charges to the f. o. b. sales values.*—Estimates of transportation charges were based chiefly on data of the Interstate Commerce Commission. Freight revenues of Class I, Steam Railways as percentages of commodity values at point of origin were compiled for 1928, 1930, 1933, 1936, and 1939 by the Commission. Similar percentages for intervening years were derived from the annual freight commodity statistics of the Commission, supplemented by price data from various sources, principally the Bureau of Labor Statistics. For those groups in which other forms of transportation were fairly important, e. g., motor truck for nonmanufactured foods and pipe lines for petroleum products, the percentages derived from the Interstate Commerce Commission data were checked, and where necessary, supplemented by whatever sale figures could be obtained for other forms of transportation.

c. *Distribution of producers' sales including transportation charges among sales to wholesalers, to retailers, and direct to ultimate users.*—Appropriate percentage distributions were derived for 1929, 1935, and 1939 from detailed industry data reported in *Distribution of Sales of Manufacturing Plants*. For intercensal years, the derived census year percentages, most of which did not change appreciably, were interpolated along a straight line.

d. *Addition of imports to sales to wholesalers in order to derive total cost to wholesalers.*—Imports for consumption including duty were assembled from the annual data of the Department of Commerce in *Foreign Commerce and Navigation*.

e. *Adjustment of total cost to wholesalers for changes in inventories held by wholesalers in order to derive cost of goods sold by wholesalers.*—Approximate inventory-cost of goods ratios for comparable kinds of business were derived for 1929, 1933, 1935, and 1939 from the *Wholesale Census*. These were interpolated for intercensal years by similar ratios derived from *Statistics of Income* data for wholesale corporations. Application of the annual ratios to our estimates of total cost to wholesalers made possible the computation of inventories held by wholesalers and the subsequent correction for inventory changes.

f. *Addition of wholesale mark-ups to cost of goods sold by wholesalers in order to get sales by wholesalers.*—Operating expenses as a percentage of net sales for comparable kinds of business were derived for 1929, 1933, 1935, and 1939 from the *Wholesale Census*. Expense-ratios derived from non-census data were used to interpolate for intercensal years whenever possible; when appropriate wholesale data were lacking, the movement of the comparable group expense-ratios for retail trade were used. Profit and loss allowances required to translate the expense-ratios into gross-margin ratios were derived from non-census wholesale data or from gross margin-expense relationships developed for comparable retail groupings. The adequacy of the profit and loss allowances was checked and substantiated by comparison with *Statistics of Income* data for wholesale corporations, 1929–39, and for non-corporate wholesale concerns for 1936 and 1939. Finally the gross-margin ratios were converted to mark-ups (if  $M$  is the mark-up or percentage of cost and  $G$  the gross-margin, or percentage of

sales,  $M = \frac{G}{100 - G}$ ) and applied to the estimates of cost

of goods sold by wholesalers.

g. *Subtraction of exports from sales by wholesalers.*—Export data were obtained from the annual data in *Foreign Commerce and Navigation*: For a number of groups, particularly most of those in the producers' durable classification, it was found that exports were either made directly by the producer or at prices closer to producers' prices than to wholesale prices. The export adjustment for these groups was applied before distributing producers' sales among those to wholesalers, retailers, and ultimate users; i. e., before step (c). No adjustment was made to remove lend-lease exports in 1941.

h. *Distribution of domestic sales by wholesalers among sales to retailers and direct to ultimate users.*—Appropriate distribution percentages for detailed kinds of business were derived for 1935 and 1939 from *Wholesale Census*

data. Between 1935 and 1939 the percentages were interpolated along a straight line; prior to 1935, the 1935 percentages were used. The smallness of the changes between 1935 and 1939 suggest that no serious distortion is likely as a result of using constant percentages before 1935.

i. *Adjustment of total cost to retailers (obtained by summing (c) and (h) for changes in inventories held by retailers in order to derive cost of goods sold by retailers.*—Approximate inventory-cost of goods ratios for comparable types of stores were derived for 1929, 1933, 1935, and 1939 from the *Retail Census*. These were interpolated for intercensal years by similar ratios derived from *Statistics of Income* data for retail corporations. Application of the annual ratios to the estimates of total cost to retailers made possible the computation of inventories held by retailers and the subsequent correction for inventory changes.

j. *Addition of retail mark-up to cost of goods sold by retailers to derive sales by retailers.*—Operating expenses

as a percentage of net sales for comparable types of stores were derived for 1929 and 1935 from the *Retail Census*. For 1933 and 1939 the less complete census data had to be adjusted to allow for all operating expenses before similar ratios could be computed. Expense-ratios derived from a wide variety of non-census data were used to interpolate for intercensal years. Profit and loss allowances required to translate the expense-ratios into gross-margin ratios were derived from the noncensus data. The adequacy of these allowances was checked and substantiated by comparison with *Statistics of Income* data for retail corporations, 1929–39, and for noncorporate retail concerns for 1936 and 1939. Finally the gross-margin ratios were converted to mark-ups and applied to the estimates of cost of goods sold by retailers.

k. *Determination of total cost to ultimate users.*—To obtain total cost to ultimate users producers' direct sales, wholesalers' direct sales and sales by retailers were summated.